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ORIGINAL PAPER

# Sociomoral Reasoning, Empathy, and Meeting Developmental Tasks During the Transition to Adulthood in Autism Spectrum Disorder

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**Abstract** This mixed methods study investigated sociomoral reasoning, empathy, and challenging and supportive factors during the transition to adulthood in emerging adults (18–27-years-old) with autism spectrum disorder (ASD) to better understand how these variables facilitated positive developmental outcomes. Same-aged ASD ($n = 22$) and typically developing (TD) ($n = 22$) groups completed quantitative and qualitative measures assessing these constructs. Compared to the TD group, the ASD group had significantly lower sociomoral reasoning and perspective-taking, significantly higher personal distress, but similar empathic concern. Inductive content analysis showed those with ASD and better developmental outcomes more often discussed the value of informal social support and utilized perspective-taking during challenging sociomoral situations.

**Keywords** Empathy · Sociomoral reasoning · Developmental outcomes · Transition to adulthood · Autism spectrum disorder

## Introduction

For those with autism spectrum disorder (ASD), the transition to adulthood, a time of burgeoning independence coupled with expanding educational and employment opportunities, is a time of developmental risk (Taylor and Seltzer 2010). After high school, young adults with ASD lose access to many, if not all of, the support services previously received through the school system, at a time when they also experience a slowing of improvement in ASD symptoms (Taylor and Seltzer 2010). In conjunction with this loss of services, the challenges of ASD, including social communication impairments, repetitive behavior [American Psychological Association (APA) 2013], and difficulties with adaptive behavior (Klin et al. 2007), make it particularly challenging for those with ASD to navigate the transition to adulthood. Currently, 1 in 68 children have ASD; more of whom become adults each year as the prevalence of ASD continues to rise (Centers for Disease Control and Prevention 2014). Accordingly, the United States Department of Health and Human Services' Interagency Autism Coordinating Committee (IACC 2013) stressed the critical need for additional research on adults with ASD.

Although ASD is typically diagnosed in childhood, it presents challenges across the lifespan (APA 2013). Similar to those without disabilities, young adults with ASD face developmental tasks such as completing school, living independently, becoming employed, and starting a family. While all young adults with disabilities face these

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normative transitions, those with ASD encounter unique difficulties. Compared to young adults with other disabilities, they are significantly more likely to be socially isolated (Orsmond et al. 2013), less likely to have ever lived independently (Anderson et al. 2014), and more likely to be disengaged from employment or education (Shattuck et al. 2012). For those with ASD, this lack of involvement worsens over the initial ten years after high school (Taylor and Mailick 2014). Research also indicates that over 50 % of adults with ASD are dependent on their families or state or private institutions for support in employment, education, and living arrangements (Magiati et al. 2014).

Moral and character education programs, which seek to cultivate supportive relationships and foster empathic and sociomoral growth, could potentially promote positive developmental outcomes in young adults with ASD. For typically developing (TD) youth, developing empathy and being in nurturing relationships are recognized as critical for sociomoral reasoning development and positive adult outcomes (Berkowitz and Bier 2014; Hoffman 2000). However, to date, little attention has focused on supporting empathic development to improve social skills in those with ASD, a lack of emphasis stemming from early reservations about whether they are even capable of empathy, based on their difficulties with theory of mind (ToM) tasks (Baron-Cohen 1995; Gillberg 1992).

Most researchers investigating morality and ASD have used Turiel's (1983) domain theory, which posits that even preschool-aged children can distinguish moral (concerns about justice, rights, and welfare), social conventional (concerns about social norms, authority, and rules), and personal domains (private concerns such as music choice). While children with ASD can distinguish moral from conventional transgressions (Blair 1996; Shulman et al. 2012), they experience subtle difficulties deciphering more advanced moral scenarios that require using a person's intentions to distinguish accidental from intentional harm (Moran et al. 2011; Rogé and Mullet 2011) or to determine whether to forgive someone (Rogé and Mullet 2011). Prior research from a Kohlbergian perspective, which focuses on more complex sociomoral reasoning, shows that children and adolescents with ASD have less adequate sociomoral reasoning than TD peers (Senland and Higgins-D'Alessandro 2013; Takeda et al. 2007). Senland and Higgins-D'Alessandro (2013) found that on average, the sociomoral reasoning of adolescents with ASD was pre-conventional, as they predominately used Stage 2 thinking but showed some signs of Stage 3 reasoning. In contrast, the sociomoral reasoning of TD adolescents was conventional, as they were fully reasoning at Stage 3. In general, those who reason at the pre-conventional level focus on obeying authority figures who are perceived as having the power to punish wrong behavior and reward right actions, and on engaging in interactions involving concrete reciprocal exchanges (Kolhberg 1984). In contrast, those who reason at the conventional level have internalized social norms, and focus on doing right by meeting the expectations of those closest to them and obeying society's rules and laws (Kolhberg 1984). In Senland and Higgins-D'Alessandro's study, adolescents with ASD were also more likely to generate challenging sociomoral situations involving social conflicts or isolation, while TD adolescents focused on sociomoral situations about helping others and managing relationships, illuminating how social situations are challenging, even negative for many youth with ASD, but constitute opportunities for growth for TD youth. However, less is known about the daily challenging sociomoral situations of young adults with ASD.

In addition, none of these studies examined the development of more complex and multifaceted sociomoral reasoning for those with ASD in young adulthood, a time when most TD young adults are utilizing conventional sociomoral reasoning (Gibbs et al. 1992). Being able to coordinate social-perspectives, a struggle for those with ASD (Baron-Cohen and Wheelwright 2004), is a prerequisite for transitioning to conventional reasoning (Gibbs 2014). Conventional reasoning predicts job performance (Rest et al. 1999) and is important for functioning in adulthood (Gibbs 2014; Kolhberg 1984). Thus, the current study extends knowledge about sociomoral reasoning in young adults with ASD by (a) investigating whether they are able to transition to more advanced conventional sociomoral reasoning, despite difficulties with perspective-taking, and (b) learning more about the challenging sociomoral situations they experience in their daily lives, compared to their TD peers, to facilitate the design of interventions.

Furthermore, given empathy's key role in facilitating sociomoral reasoning development (Gibbs 2014; Hoffman 2000), it is crucial to investigate how young adults with ASD experience empathy. This study took a multidimensional approach to empathy, considering cognitive and affective empathy as distinct capacities (Davis 1983; Rogers et al. 2007; Rueda et al. 2015; Schwenck et al. 2012). Davis' (1983) terminology is used; thus, cognitive empathy refers to perspective-taking; affective empathy refers to empathic concern and to personal distress.

A multidimensional conception of empathy is particularly useful for ASD research. Early research suggested empathy impairments were characteristic of ASD based on ToM limitations (Baron-Cohen 1995; see Yirmiya et al. 1998, for a review), but more recent research indicates more nuanced empathic strengths and challenges in ASD (Senland and Higgins-D'Alessandro 2013; Rueda et al. 2015). ToM, often used interchangeably with cognitive empathy in ASD studies (Schwenck et al. 2012; Rueda et al. 2015), refers to the capacity to interpret others' mental states, such as their intentions, feelings, and wants (Baron-Cohen 1995). While children and adults with high functioning ASD can often pass basic ToM tasks (Bowler 1992; Dahlgren and Trillingsgaard 1996), they often, but not always (Begeer et al. 2010; Scheeren et al. 2013), experience impairments on advanced and naturalistic ToM tasks that assess more subtle ToM difficulties in comprehending intentions when people say things they do not mean (Schwenck et al. 2012), interpreting animated stimuli interacting in ways that suggest intentionality (Jones et al. 2010), or understanding intentions, deception, and sarcasm in videos of conversations (Mathersul et al. 2013). Those with high functioning ASD also perceive themselves as having less perspective-taking than TD peers on self-reported measures of cognitive empathy (Senland and Higgins-D'Alessandro 2013; Rueda et al. 2015).

Smith's (2009) empathy imbalance hypothesis of ASD tries to account for research indicating that individuals with ASD struggle with cognitive empathy but have normal or enhanced affective empathy. Indeed, an emerging body of research suggests children, adolescents, and adults with ASD perceive themselves as experiencing similar empathic concern, but enhanced personal distress, as TD peers (Rogers et al. 2007; Rueda et al. 2015; Senland and Higgins-D'Alessandro 2013). Despite more refined measurement of ToM and understanding of affective empathy in ASD, little is known about how young adults with ASD use cognitive and affective empathy during their daily unstructured social situations and how doing so relates to developmental outcomes in adulthood. Thus, the current study extends prior research on empathy and ASD by (a) further exploring self-reported perceptions of cognitive and affective empathy in ASD, (b) investigating how young adults with ASD utilize empathy during real-life challenging sociomoral situations, and (c) examining the relationship between empathy and positive developmental outcomes for young adults with ASD.

Despite increased knowledge about developmental outcomes for adults with ASD, we have no knowledge of a study about such outcomes that considers the perspective of those with ASD. Higher cognitive ability in childhood (Farley et al. 2009; Magiati et al. 2014), lesser ASD symptoms (Eaves and Ho 2008; Howlin et al. 2013; Taylor and Seltzer 2011), language/useful speech by age 6 (Levy and Perry 2011; Gillespie-Lynch et al. 2012), and higher adaptive behavior (Farley et al. 2009; Taylor and Seltzer 2011) have been linked to better outcomes in adulthood. Less is known about how young adults with ASD, compared to TD peers, perceive factors challenging and supporting their transition to adulthood, and how such factors are related to better outcomes. Considering developmental outcomes in the context of empathy, sociomoral reasoning, and supportive and challenging factors during the transition to adulthood in ASD, as in the current study, is crucial because these variables are potentially malleable and amenable to intervention when necessary.

Developmental outcomes in adulthood in ASD are often assessed with variations of Howlin et al.'s (2004) developmental outcomes measure, which combines data on participants' employment, friendships, and independence. To allow for comparisons with prior research, the current study used an adapted version of this measure. In prior studies using Howlin et al.'s measure, estimates of adults with ASD achieving a very good/good outcome (with at least supported employment, some friends, and independence) ranged from 17 to 48 %, estimates of fair outcomes (with some independence but no close friends) ranged from 19 to 34 %, and estimates of poor/very poor outcomes (with little to no independence or friends) ranged from 17 to 60 % (Eaves and Ho 2008; Farley et al. 2009; Gillespie-Lynch et al. 2012; Howlin et al. 2004, 2013). Farley et al.'s (2009) participants had the best developmental outcomes, perhaps because most were Mormons; this faith community is uniquely supportive of those with disabilities, even providing employment assistance.

While most of those with ASD have fair to poor developmental outcomes, little is known about how they perceive their transition to adulthood, with the exception of two recent studies. Giarelli et al. (2013) conducted a thematic content analysis of 14 young adults (aged 18–23) with high functioning ASD, and their perceptions of the "barriers or bridges" (p. 563) to transitioning to college, employment, and/or independent living. Beneficial bridges included: accommodations, cognitive abilities, personal qualities (e.g., being empathic, friendly), and mentor's qualities (e.g., modeling appropriate behavior, accepting differences). Barriers included: behavioral problems (e.g., difficulty socializing, rigidity), associated features (e.g., meltdowns, anxiety), personal factors (e.g., low self-esteem, low motivation), and institutional factors (e.g., inflexibility, lack of orientation). In a grounded theory analysis of the perceptions of the difficulties and support needs of 23 college students with ASD (aged 18–25), Van Hees et al. (2015) highlighted the value of psychological support and social coaching, especially from therapists, family, and an assigned person rather than a social skills group. The current study further extends knowledge on how young adults with ASD perceive factors supporting and challenging their transition to adulthood by comparing their experiences to those of TD peers and examining these factors in relation to developmental outcomes, both important steps toward designing support programs uniquely attuned to their needs.

This exploratory concurrent mixed methods study builds on prior work (Senland and Higgins-D'Alessandro 2013) to obtain a more detailed understanding of sociomoral reasoning, empathy, developmental outcomes, and supportive and challenging factors during the transition to adulthood in ASD, compared to TD peers. Based on prior research comparing sociomoral reasoning and empathy in ASD and TD groups (Rogers et al. 2007; Senland and Higgins-D'Alessandro 2013) we predicted the following: 1. Compared to the TD group, the ASD group would have significantly lower sociomoral reasoning, lower perspective-taking, and higher personal distress. 2. Jones et al.'s (2010), Rogers et al.'s (2007), and Senland and Higgins-D'Alessandro's (2013) findings of no differences in empathic concern between the ASD and TD groups would be replicated. 3. Based on prior research highlighting the continued struggles of those with ASD in adulthood (Eaves and Ho 2008; Howlin et al. 2004), we expected them to have poorer developmental outcomes than TD young adults.

Qualitative and mixed methods research questions included: 1. What similarities and differences in morality and empathy emerged as the TD and ASD groups discussed their challenging sociomoral situations? Do such similarities and differences vary by developmental outcome for the ASD group? 2. What were the similarities and differences in the personal (e.g., individual characteristics such as resourcefulness) and contextual factors (e.g., supportive relationships) that young adults in the TD and ASD groups pinpointed as supporting and challenging their transition to adulthood? Do such similarities and differences vary by developmental outcome for the ASD group?

## Method

### Participants

Participants were part of a larger study including young adults with nonverbal learning disability. The ASD group ($n = 22$) was recruited in the northeastern United States from ads posted on websites of ASD associations and from support programs for college-aged students with ASD. Inclusion criteria included the following: (a) being aged 18–27-years-old; (b) being able to self-report having been diagnosed by a qualified professional (e.g., clinical psychologist or psychiatrist) with a high functioning ASD (Asperger syndrome, high functioning autism, or pervasive developmental disorder not otherwise specified) using *Diagnostic and Statistical Manual of Mental Disorders* (4th Edition, Text Revision) criteria (APA 2000); (c) having an IQ of 70 or above (as measured by the Wechsler Abbreviated Scale of Intelligence—Second Edition (WASI-II; Wechsler 2011); and (d) being able to communicate in English. Exclusion criteria included self-diagnosis of an ASD. Ad respondents included two men and two women attending college. Six men attending a local community college were recruited from a transitional living program for those with ASD. Eleven men and one woman were recruited from a similar residential program offering high school and college-aged students with ASD and/or related socio-communication disorders academic and residential support as well as counseling; of these, eight were college-aged but high school seniors and three attended a local community college.

The TD group ($n = 22$) was recruited from a northeastern United States university through a subject pool and research flyers. Inclusion criteria included being aged 18–27-years-old, having an IQ of 70 or above (as measured by the WASI-II), and being able to communicate in English. Exclusion criteria included having an ASD diagnosis.

Table 1 shows participant characteristics for the ASD and TD groups for the demographic variables of age, IQ, sex, race, family's financial status, education, and field of study. Groups were matched on sex and education; although groups were not matched on race or family's financial status, they were predominately White and middle to upper middle class. Groups did not differ by age ($t(42) = 0.09$, $p = .93$) or by IQ, as measured by the Wechsler Abbreviated Scale of Intelligence—Second Edition (Wechsler 2011) ($t(33.62) = -0.52$, $p = .60$), which was administered to all participants. The wide age range, and inclusion of some ASD participants still in high school, was necessary to capture the transition to adulthood for both groups and recognizes that the Individuals with Disabilities Act allows for a later high school graduation (at age 22). T-tests (for sociomoral and empathy variables) and Fisher's exact tests (for the developmental outcomes variable) showed no differences for sex or level of education (zero-to-four semesters of college versus five-or-more semesters of college) on any outcome variable for either group.

Sample size was informed by Guest et al. (2006), who provided an empirically based numerical guideline for determining sample size in qualitative research based on data saturation, where "no additional data are being found whereby the… [researcher] can develop properties of the category" (Glaser and Strauss 1967, p. 61). When comparing two groups, Guest et al. argued for at least 12 interviews per group. To ensure saturation, we conducted more interviews than this (22 per group), which produced data saturation.

### Procedure

Fordham University's Institutional Review Board approved this study. Informed consent was obtained prior to administration of the measures and interview. TD

**Table 1** Participant characteristics for the ASD and TD groups

| Participant characteristics | ASD group ($n = 22$) | TD group ($n = 22$) |
|---|---|---|
| Age | | |
| Mean (*SD*), years | 19.20 (2.30) | 19.30 (0.96) |
| Range, years | 18–27 | 18–21 |
| IQ | | |
| Mean (*SD*) | 104.37 (15.16) | 110.93 (8.76) |
| Range | 75–132 | 96–136 |
| Sex | | |
| Male, *n* (%) | 19 (86.36) | 19 (86.36) |
| Race | | |
| White, *n* (%) | 19 (86.36) | 18 (81.82) |
| Family's financial status | | |
| Middle to upper middle class, *n* (%) | 21 (95.45) | 21 (95.45) |
| Education | | |
| Five or more semesters of college, *n* (%) | 5 (22.73) | 5 (22.73) |
| Zero to four semesters of college, *n* (%) | 17 (77.27) | 17 (77.27) |
| Field of study[a] | | |
| Business, *n* (%) | 1 (7.14) | 5 (22.73) |
| Arts and humanities, *n* (%) | 0 (0) | 7 (31.82) |
| Science and engineering, *n* (%) | 4 (28.57) | 7 (31.82) |
| Undeclared, *n* (%) | 9 (64.29) | 3 (13.64) |

*ASD* autism spectrum disorder, *TD* typically developing

[a] For the ASD group, percentages were calculated based on the 14 participants attending college

participants took approximately one hour to complete the study (i.e., about 25 min for the questionnaires, 15 min for the WAIS-II, and 20 min for the interview); ASD participants took about 1 h and 15 min to do so (i.e., 30 min for the questionnaires, 20 min for the WAIS-II, and 25 min for the interview). Every participant was comfortable and engaged throughout the study. All interviews were conducted by the first author (AS). As compensation, ASD participants received a $20 gift-card; TD participants received course credit or a $20 gift-card.

## Measures

### *Demographic Questionnaire*

Participants completed a demographic questionnaire indicating their age, sex, ethnicity, family's financial status, and level of education most recently completed. ASD participants confirmed their ASD diagnosis; TD participants confirmed that they did not have an ASD.

### *Interpersonal Reactivity Index (IRI)*

Davis' (1980) IRI assesses cognitive (perspective-taking) and affective (empathic concern and personal distress) empathy; participants completed three, seven item subscales. The perspective-taking (PT) subscale assesses one's ability to take another's point of view with items such as, "I try to look at everybody's side of a disagreement before I make a decision" (Davis 1980, p. 11). The empathic concern (EC) subscale assesses warmth and compassion for others with items such as, "When I see someone being taken advantage of, I feel kind of protective towards them" (Davis 1980, p. 11). The personal distress (PD) subscale measures anxiety in stressful emotional situations, with items such as, "Being in a tense emotional situation scares me" (Davis 1980, p. 11). Mark Davis (personal communication, February 23, 2009) gave permission to eliminate idioms from five of the 21 items to facilitate understanding for those with ASD. Participants rated each item on a Likert scale from 0 (*Does not describe me well*) to 4 (*Describes me very well*). Individual scores for each subscale were calculated by summing its items; higher scores represent more empathy.

The IRI correlates with other empathy measures (Davis 1983). Davis' (1980) Cronbach's alphas for subscales in that study ranged from 0.70 to 0.78. For the current study, Cronbach's alphas for the ASD and TD groups respectively were 0.80 and 0.71 for the PT subscale, 0.84 and 0.83 for the EC subscale, and 0.64 and 0.68 for the PD subscale.

### *Sociomoral Reflection Measure: Short Form (SRM-SF)*

The SRM-SF (Gibbs et al. 1992) includes 11 short answer items assessing a revised version of the first four stages of Kolhberg (1984) theory of sociomoral reasoning development (Gibbs 2014). Participants evaluate and justify the importance (very important, important, or not important) of sociomoral values including contract and truth, affiliation, life, property and law, and legal justice. The Sociomoral Reflection Maturity Score (SRMS) was obtained by multiplying the mean of the item ratings by 100 (range 100–400); a higher SRMS indicates more advanced sociomoral reasoning (Gibbs et al. 1992). In the current study, a second trained coder independently scored 11 randomly selected protocols per group. The SRMS correlation between raters was $r = .98$ for the ASD group and $r = .97$ for the TD group.

### *Developmental Outcomes*

An adapted version of Howlin et al.'s (2004) developmental outcomes measure examined participants' ability to meet developmental tasks associated with young adulthood in three domains: education and employment, friendships, and independence. Participants' open and closed-ended responses in each domain were rated according to Howlin et al.'s scheme, with minor modifications. Specifically, Howlin et al.'s original scheme assessed employment but not education; therefore, minor modifications ensured that it could also be used with young adults pursuing education, as in the current study. For example, prior to the employment questions, participants were asked whether they were taking high school classes or part-time or full-time college classes and to describe the support services that they received in their educational setting.

Education and employment domain ratings ranged from 0 for those employed or in school full-time (Howlin et al. 2004) to 3 for those without work or educational day activities or for those attending a specialized school providing intensive treatment in a restrictive environment. Friendship domain ratings ranged from 0 for those with more than one same-aged friendship involving sharing various activities and exchanging confidences (Howlin et al. 2004) to 3 for those with some acquaintances in arranged social groups. The floor of this domain was changed from Howlin et al.'s (2004) study where a 3 represented no friends or acquaintances because in the current study, all ASD participants had at least one acquaintance, likely because most were still in support programs facilitating social activities. Independence domain ratings ranged from 0 for those living independently, on-campus, or with their parents while attending college full-time, to 5 for those in hospital care (Howlin et al. 2004). Modifications included expanding the rating of 0 to include full-time students living on-campus or commuting.

Ratings were summed across domains to obtain a composite measure of developmental outcomes (Howlin et al. 2004). Possible outcomes included: 4 = very good outcome (domain total = 0–2); 3 = good outcome (total = 3–4); 2 = fair outcome (total = 5–7); 1 = poor outcome (total = 8–10); 0 = very poor outcome (total = 11) (Howlin et al. 2004). Inter-coder agreement was established with a second coder, unassociated with data collection or analysis, who independently coded 11 randomly selected protocols for each group. Cohen's weighted kappa was 1.00 for both groups.

### *Difficult Real-Life Sociomoral Situations Interview-Expanded Version (DRLSSI-EV)*

The interview was adapted from prior work (Senland and Higgins-D'Alessandro 2013). Drawing on studies in the moral development literature that have asked participants to generate real-life moral dilemmas (Walker et al. 1999; Wainryb et al. 2005), Part A of the interview asked participants to recall a personal challenging sociomoral situation. Accordingly, participants were asked to describe a recent difficult situation when they were with someone, a problem arose, and they did not know what the right or wrong thing to do was, to discuss what they did and why, and to describe what they learned.

To develop a deeper understanding of how young adults with ASD perceived their own transition to adulthood, compared to their TD peers, Part B of the interview asked participants to identify and describe factors, for instance, other people, support services, or their own experiences, or their own personal characteristics such as persistence or resourcefulness, that were most helpful and that were least helpful as they moved into young adulthood.

Inter-coder agreement was established with a second coder who independently coded 11 randomly selected protocols per group (Creswell 2009). Cohen's kappa for Parts A and B combined was 0.86 for the ASD group and 0.91 for the TD group.

## Qualitative Analysis

Qualitative analysis was informed by prior work (Senland and Higgins-D'Alessandro 2013). Participant responses to Parts A and B of the DRLSSI-EV were analyzed separately using inductive content analysis, where categories emerge from the data rather than from preconceived hypotheses or classification systems (Morgan 1993). Creating categories involved examining participants' responses and "identifying salient themes, [and] recurring ideas" (Marshall and

Rossman 1995, p. 114). Subcategories were created with line-by-line coding, as themes and ideas in each line of responses were examined and named (Marshall and Rossman 1995). Subcategories representing common themes were combined and used as major categories. Table 2 provides descriptions of the major categories for Part A and B of the DRLSSI-EV. Responses to Part A were examined for empathy to determine whether groups differed in their expression of qualitative themes reflecting perspective-taking and empathic concern, as measured quantitatively by Davis' (1980) IRI. Consistent with Davis' terminology, perspective-taking was defined as the capacity to take another's point of view; empathic concern was defined as a sense of compassion for others.

To ensure reliability, interviews were audio-taped, transcribed, and double-checked for errors (Creswell 2009). To ensure credibility, the first author (AS) developed the initial coding scheme, which was adapted following discussion with the second author (AH) who noted questions about categories and suggested additional codes (Barker and Pistrang 2005). The authors discussed ambiguous cases and reached consensus. Based on this, a final coding manual was constructed. Then, all data was coded blindly by the first author; the second coder blindly coded 11 randomly selected protocols to obtain inter-coder agreement.

## Results

This section presents quantitative results for group differences in sociomoral reasoning, empathy, and developmental outcomes, followed by qualitative and mixed methods results comparing groups' sociomoral and empathic thinking and perceptions of supportive and challenging factors during the transition to adulthood. Considering the current study's exploratory aims and small sample size, qualitative similarities and differences

**Table 2** Major categories for parts A and B of the difficult real-life sociomoral situations interview-expanded version

| Interview section[a] | Major categories | Description |
|---|---|---|
| Part A | Helping others | Prosocial intentions of helping others (e.g., determining how to best help a friend failing school) |
| | Dealing with social conflict, isolation, bullying | Direct or indirect conflict; ostracism, teasing, bullying (e.g., conflict among friends) |
| | Managing social relationships | Active attempt to balance everyone's needs/feelings (e.g., compromising) |
| | Failing to appropriately balance needs/resources | Situation occurs or worsens because of failure to appropriately balance needs/resources (e.g., developing hypothermia because of failure to request assistance when cold) |
| Part B | S-Support programs | Current or prior support programs (e.g., college orientation, specialized schools) |
| | S-Informal support | Includes informal social support from: (a) family, (b) caring adults outside the family, (c) friends, and/or (d) the broader community |
| | S-Personable | Personality traits (e.g., social, outgoing, friendly) or a physical appearance that bring others toward them, facilitating friendships |
| | S-Positive attitude | Excitement toward college and its opportunities; openness to new experiences |
| | S-Hard work and commitment | Hard work, knowledge, self-control, determination, and dedication |
| | C-Nature of program/school | Difficulties negotiating "red tape;" Unclear policies, procedures, or directions |
| | C-Family | Conflicts between personal career goals and parental ambitions; Overprotective parents; Pressure to engage in activities and experiences |
| | C-Adults | Same as family except challenges occur with non-familial caring adults |
| | C-Peers | High school friendships or initial college friendships hold young adults back from developing new or deeper friendships in college; Minor misunderstandings and disagreements initially hinder friendships |
| | C-Bullies | "Scars" or bad memories from being bullied in the past |
| | C-Non-personable | Shyness, and/or weak social skills make meeting others difficult; hesitancy about new experiences |
| | C-Negative attitude | Sarcasm, procrastination, laziness, and/or lack of motivation |
| | C-Psychological struggles | Anxiety, emotionality, insecurity, depression, and/or psychological struggles |

*S* supportive factor, *C* challenging factor

[a] Interview questions are described in the method section

**Table 3** Differences in empathy and sociomoral reasoning

| Outcome variable | Group | | $t$ | $df$ | $p$ | Cohen's $d$ |
|---|---|---|---|---|---|---|
| | ASD[a]<br>$M \pm SD$ | TD[a]<br>$M \pm SD$ | | | | |
| IRI PT | 15.48 ± 5.74 | 19.45 ± 4.47 | −2.57 | 42 | .01* | 0.77 |
| IRI PD | 11.91 ± 4.75 | 8.73 ± 4.04 | 2.39 | 42 | .02* | 0.72 |
| IRI EC | 19.14 ± 6.26 | 19.55 ± 4.73 | −0.25 | 42 | .81 | 0.07 |
| SRMS | 279.77 ± 33.48 | 317.68 ± 24.51 | −4.29 | 42 | <.001** | 1.29 |

*IRI* Interpersonal Reactivity Index, *PT* perspective-taking, *EC* empathic concern, *PD* personal distress, *SRMS* Sociomoral Reflection Maturity Score, *ASD* autism spectrum disorder, *TD* typically developing

* $p < .05$; ** $p < .01$

[a] $n = 22$

between groups were based on descriptive frequencies and percentages of each group's use of major categories (Morgan 1993). A frequency difference of $n \geq 4$ was used as the criterion to define group "differences." When comparing the ASD and TD groups, as well as the ASD groups with very good/good and fair outcomes, the average frequency difference across all categories was 3.18; therefore, $n \geq 4$ represents a larger than average group difference. Analysis of qualitative data by Chi square analysis would, in most circumstances, have led to expected frequencies too small to meet the analysis's assumptions, potentially leading to Type II errors.

## Differences in Sociomoral Reasoning, Empathy, and Developmental Outcomes

Hypotheses testing empathy and sociomoral reasoning differences between groups were confirmed. As Table 3 shows, compared to the TD group, the ASD group had significantly lower IRI PT and SRMS scores, significantly higher IRI PD scores, but similar IRI EC scores. Effect sizes were medium for IRI PT ($d = 0.77$) and IRI PD ($d = 0.72$), as well as large for SRMS ($d = 1.29$), suggesting TD youth experience markedly less personal distress empathy but have considerably higher perspective-taking and sociomoral reasoning capacities than young adults with ASD (Cohen 1988).

As hypothesized, the TD group had significantly better developmental outcomes than the ASD group ($\chi^2$ (2, $N = 44$) = 33.44, $p < .001$, Cramer's V = 0.87). All TD participants had very good outcomes. For the ASD group, percentages among the developmental outcomes categories were the following: 13.64 % very good, 27.27 % good, 59.10 % fair, 0 % poor, and 0 % very poor. The good and very good categories were combined because fewer ASD participants were in these categories than the fair category; the poor and very poor categories were not considered in the data analysis because neither had any ASD participants. Combining the good and very good categories and comparing them to the fair category was logical considering participants' functional level. Those with very good/-good outcomes did well in education/employment and had at least some friends; those with fair outcomes had less success in school, work, and friendships. As indicated, no ASD participants had poor or very poor outcomes, likely because participants were predominantly recruited from support programs that served young adults with ASD who did not have intellectual disabilities and also provided them with some autonomy.

## Qualitative and Mixed Methods Comparisons of Groups' Sociomoral and Empathic Thinking

As Table 4 shows, the ASD and TD groups were both about as likely to describe challenging situations that involved managing social relationships, which necessitated an active attempt to balance everyone's needs/feelings (e.g., compromising). Compared to the TD group, the ASD group was more likely to describe challenging sociomoral situations dealing with social conflict, isolation, and bullying. For example, Ben,[1] a 21-year-old man in the ASD group described a sociomoral conflict where he was conned, shaken down, and harassed into lending money. In contrast, a higher percentage of the TD group responded with dilemmas about helping others, such as determining how best to help a friend failing in school.

In addition, as shown in Table 4, the TD group was more likely than the ASD group to use perspective-taking and empathic concern to describe, reason about, and reflect on the lessons of these challenging sociomoral situations. For example, Garrett, a 21-year-old man in the TD group showed empathic concern when he explained that he had done his best to help his girlfriend through a difficult time because "If there is something that I have the ability to do, I should be able to use that ability to help, and I know that I

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[1] Names of participants in each group have been replaced with pseudonyms.

**Table 4** Frequencies and percentages comparing groups' challenging sociomoral situations and empathic capacities

| Major categories | ASD[a] *n* (%) | TD[a] *n* (%) | ASD very good/good[b] *n* (%) | ASD fair[c] *n* (%) |
|---|---|---|---|---|
| Challenging sociomoral situations | | | | |
| Helping others | 2 (9)[d] | 9 (41)[d] | 2 (22) | 0 (0) |
| Dealing with social conflict, isolation, bullying | 11 (50)[d] | 2 (9)[d] | 2 (22)[d] | 9 (69)[d] |
| Managing social relationships | 6 (27) | 8 (36) | 5 (56)[d] | 1 (8)[d] |
| Failing to appropriately balance needs/resources | 3 (14) | 0 (0) | 0 (0) | 3 (23) |
| Empathy | | | | |
| Perspective-taking | 9 (41)[d] | 16 (73)[d] | 7 (78)[d] | 2 (15)[d] |
| Empathic concern | 7 (32)[d] | 12 (55)[d] | 5 (56) | 2 (15) |

Percentages may not add up to 100 % because they represent the percentage of participants per group generating responses in each major category. Participant responses could represent more than one major category. Additionally, this study is part of a larger study about young adults with ASD; therefore, only major categories relevant to this study were included

*ASD* autism spectrum disorder, *TD* typically developing

[a] $n = 22$

[b] $n = 9$

[c] $n = 13$

[d] Frequency difference between groups ≥4

have the ability to comfort her and make her feel better." In addition, Connor, a 27-year-old man in the ASD group, caught in the middle of a conflict, demonstrated perspective-taking by acknowledging, "They both had valid points… so I couldn't tell either my mom or my friend that they were in the right."

Use of empathy and the type of challenging sociomoral situation generated also varied by developmental outcome in the ASD group, as shown in Table 4. Compared to those with ASD who had fair outcomes, those with ASD with very good/good developmental outcomes were more likely to generate challenging sociomoral situations about managing social relationships and less likely to discuss those involving social conflict, isolation, and bullying. Given that managing social relationships requires considering others' needs and feelings, this is consistent with results that those with better outcomes were also more likely to utilize perspective-taking to reason about and resolve their self-reported challenging sociomoral situations. Their higher use of perspective-taking may have also reduced the social conflict present in such situations.

## Qualitative and Mixed Methods Comparisons of Groups' Perceptions of Supportive and Challenging Factors During the Transition to Adulthood

As shown in Table 5, regarding supportive contextual factors, both the ASD and TD groups described the positive value of informal support from family, caring adults, friends, and the broader community during the transition to adulthood. For both groups, family provided a solid foundation for pursuing new opportunities, while friends served as companions during such explorations. For example, Javier, a 19-year-old man in the TD group emphasized the importance of knowing that his family would "support any decision that I made. If I wasn't having a good time here, I could change my situation." Brett, a 20-year-old man in the ASD group described the support he received from friends who "helped me to learn from mistakes and move on from them. And they have said positive things about me." Community facilitated a sense of belonging, as Jake, a 21-year-old man in the TD group explained, "The dorm I was in freshman year was community oriented so everyone knew each other. It was the combination of being on the campus… and knowing everyone around you."

In contrast to the similarities in the groups' perceptions of the importance of informal support, the ASD group was more likely than the TD group to describe how support programs such as transitional living programs facilitated their transition to adulthood by helping them to develop socioemotional, independent living, and job skills. For example, Tyrone, a 20-year-old man in the ASD group described what he learned from his support program as follows: "It is teaching me all sorts of appropriate social skills and… how to handle some possible difficult situations and what it takes to be independent and basically do all that there is to live by myself."

As shown in Table 5, regarding supportive personal factors, the TD group was more likely than the ASD group

**Table 5** Frequencies and percentages comparing groups' perceptions of supportive and challenging factors during the transition to adulthood

| Overarching categories | Major categories | ASD[a] *n* (%) | TD[a] *n* (%) | ASD very good/good[b] *n* (%) | ASD fair[c] *n* (%) |
|---|---|---|---|---|---|
| Supportive contextual factors | | | | | |
| | Support programs | 11 (50)[e] | 1 (5)[e] | 3 (33)[e] | 8 (62)[e] |
| | Informal support[d] | 24 (27) | 25 (28) | 15 (42)[e] | 9 (17)[e] |
| Supportive personal factors | | | | | |
| | Personable | 1 (5)[e] | 9 (41)[e] | 0 (0) | 1 (8) |
| | Positive attitude | 1 (5)[e] | 5 (23)[e] | 0 (0) | 1 (8) |
| | Hard work and commitment | 2 (9) | 3(14) | 0 (0) | 2 (15) |
| Challenging contextual factors | | | | | |
| | Nature of program/school | 2 (9) | 2 (9) | 1 (11) | 1 (8) |
| | Family | 4 (18) | 3 (14) | 1 (11) | 3 (23) |
| | Adults | 4 (18)[e] | 0 (0)[e] | 2 (22) | 2 (15) |
| | Peers | 2 (9) | 3 (14) | 1 (11) | 1 (8) |
| | Bullies | 3 (14) | 0 (0) | 1 (11) | 2 (15) |
| Challenging personal factors | | | | | |
| | Non-personable | 5 (23) | 7 (32) | 0 (0)[e] | 5 (38)[e] |
| | Negative attitude | 5 (23) | 2 (9) | 3 (33) | 2 (15) |
| | Psychological struggles | 6 (27) | 3 (14) | 3 (33) | 3 (23) |

Percentages may not add up to 100 % because they represent the percentage of participants per group generating responses in each major category. Participant responses could represent more than one major category. Additionally, this study is part of a larger study about young adults with ASD; therefore, only major categories relevant to this study were included

*ASD* autism spectrum disorder, *TD* typically developing

[a] $n = 22$

[b] $n = 9$

[c] $n = 13$

[d] Includes informal support from: (a) family, (b) caring adults outside the family, (c) friends, and/or (d) the broader community

[e] Frequency difference between groups $\geq 4$

to perceive a personal quality of theirs as facilitating the transition to adulthood. Specifically, they were more likely to describe the benefits of being personable, including a sense that one's personality traits (e.g., being social, friendly) helped initiate and sustain friendships. As Kathryn, a 19-year-old woman in the TD group explained, being "talkative and outgoing definitely helped… if you were shy and more introverted you would probably definitely find friends eventually but it might take you a little longer." Similarly, the TD group was more likely to describe the advantages of a positive attitude, which likely also attracted friends. A positive attitude included excitement toward and openness to new experiences and opportunities, as illustrated by Allison, a 19-year-old woman in the TD group: "But I was so excited—I always knew that I wanted to come here to go to college and have that independence and meet new people."

As shown in Table 5, regarding challenging contextual factors, both groups were as likely to describe being challenged by the nature of the school/support program, peers, and their family, but only the ASD group discussed how non-familial adults challenged their transition to adulthood. Both groups explained that others impeded their growth by being too restrictive, being too supportive/overprotective, and/or setting too high expectations. For the ASD group, support programs or college experiences were perceived as a hindrance when too challenging or too supportive, based on the participant's current functioning level. For example, Connor described feeling overwhelmed in a "class for introverted people" where:

> they just tried forcing me to interact with people and not giving me a choice… [it was] specifically designed to take me out of my comfort zone, you know like teaching a guy to swim by tossing him into the deep end of a pool while he is fully clothed…

David, a 19-year-old man with ASD described the unstimulating support received in college as: "they just stuck a bunch of kids with a variety of disorders [together]… and attempted to teach them all basic life skills, stuff that I have been doing over and over again since kindergarten."

Similarly, referring to family difficulties, Samantha, a 19-year-old woman in the ASD group noted, "Parents—they don't want to let go! They don't want to see their little girl go off to college…" while Scott, a 21-year-old man in the TD group explained that while he appreciates that his parents "always push me," he sometimes feels "they might be pushing too much… expecting something that is not realistic yet." Young adults with ASD also made similar references to non-familial adults, specifically service providers who tried to be supportive but pressured them to meet expectations that felt too high: "She was always pushing me to self-advocate… The same with work… Even though I am doing some of my required duties… it is not enough" (Peter, a 20-year-old man in the ASD group).

As for challenging personal factors, both groups were as likely to discuss how being non-personable (e.g., being shy, having weak social skills, or being hesitant in new social situations), having a negative attitude (e.g., being lazy, lacking motivation), or managing psychological struggles such as anxiety and depression challenged their transition to adulthood. For example, Tyrone said: "I did have some kind of emotional disturbance in my head that has been making me upset… it has made me be disorganized, unwilling to do things…"

Table 5 also identifies supportive and challenging factors associated with better developmental outcomes for the ASD group. The ASD group with very good/good outcomes was more likely than those with fair outcomes to discuss the positive value of informal social support, while those with fair outcomes were more likely to note the significance of formal support programs. Neither group identified many personal factors as facilitating the transition to adulthood. Both groups perceived similar challenging personal and contextual factors, with the exception that only those with fair outcomes discussed the challenge of being non-personable.

## Discussion

### Morality, Empathy, and Developmental Outcomes

To the best of our knowledge, this is the first study to examine sociomoral reasoning in young adults with ASD. Consistent with prior research with children and adolescents (Senland and Higgins-D'Alessandro 2013; Takeda et al. 2007), young adults with ASD had less adequate sociomoral reasoning than TD peers. On average, both groups utilized Stage 3 sociomoral reasoning, but the ASD group showed some Stage 2 thinking, whereas the TD group was fully reasoning at Stage 3, with some showing Stage 4 reasoning. The large effect size ($d = 1.29$) for this difference illustrates its practical importance. The ASD group's sociomoral reasoning level (SRMS = 279.77) was comparable to that of TD high school adolescents in Senland and Higgins-D'Alessandro's (2013) study (SRMS = 285.00), who averaged 4 years younger.

Importantly though, young adults with ASD in the current study had higher sociomoral reasoning than adolescents with ASD in Senland and Higgins-D'Alessandro's (2013) study, who utilized Stage 2 and 3 sociomoral reasoning (SRMS = 246.00). Furthermore, the gap between adolescents with ASD in Senland and Higgins-D'Alessandro's study and young adults with ASD in the current study was one third of a stage; there was a parallel gap between TD adolescents and TD young adults in these two studies. While those with ASD have less adequate sociomoral reasoning than TD peers, their reasoning seems to develop with age and at the same rate as one would expect in a TD sample, across these two cross-sectional samples. This delay in sociomoral reasoning development in young adults with ASD is consistent with Hoogenhout and Malcolm-Smith's (2014) findings of delayed ToM in high functioning ASD. However, left unanswered is whether the rate of change in sociomoral reasoning for the ASD and TD groups is the same from early childhood and when the delay in sociomoral reasoning for those with ASD first emerges.

Results for empathy were also similar to prior research assessing cognitive and affective empathy separately in ASD (Rogers et al. 2007; Senland and Higgins-D'Alessandro 2013). Self-reported limitations in perspective-taking in the ASD group might help explain why they generated more challenging sociomoral situations involving conflict while those of the TD group suggested more harmonious relationships. While quantitative results indicated that both groups were as likely to perceive themselves as having empathic concern, the ASD group experienced more difficulty utilizing this skill, as well as perspective-taking, during their self-reported spontaneous challenging sociomoral situations.

The tendency for young adults with ASD to perceive themselves as experiencing just as much empathic concern, but not perspective-taking, as TD peers is consistent with emerging brain research indicating that these types of empathy may have different neurological underpinnings (Shamay-Tsoory et al. 2009) and can be explained in light of Hoffman's (2000) theory of empathy. According to Hoffman, basic modes of empathy are biologically based and involuntary, requiring minimal perspective-taking; advanced modes emerge later, with perspective-taking development. As Hoffman's theory would suggest, without adequate perspective-taking, young adults with ASD may struggle to translate feelings of empathic concern into prosocial behavior, thus increasing personal distress, which is consistent with findings of higher personal distress in the ASD than TD group. High personal distress may then lead to empathic over-arousal, making it more challenging for them to utilize empathy in spontaneous social situations. Or, as Rogers et al. (2007) explained, young adults with ASD may experience high personal distress because others may perceive them as lacking empathy when they see themselves as experiencing empathic concern for others. In an everyday context, those with ASD may be perceived as having less empathy than they actually do because of the significant gap between their perspective-taking capabilities and those of their TD peers, as well as their struggles to translate their empathic concern into prosocial action.

While young adults with ASD may struggle with perspective-taking, their reports of empathic concern indicate the need for a more nuanced understanding of their empathic capacities and how to help these young adults develop them. If they experience empathy, and concern competes with distress, as the current study's results show, then an explicit focus on strengthening empathic concern and decreasing personal distress should be tried as a major component of support programs for ASD. McGeer (2008) and Baron-Cohen (2011) both argue that in ASD, logical and rule-based thinking facilitates development of a moral code based on rules, logic, and duty. However, the current study adds to the literature by also emphasizing how empathic concern plays a key role in motivating them to develop morally, which is consistent with Hoffman (2000) who argues that such feelings are crucial for moral development. The results of this current study and prior research (Rogers et al. 2007; Senland and Higgins-D'Alessandro 2013) show that young people with ASD have this critical emotional capacity.

While the transition to adulthood can be challenging for TD young adults, it is a time of unique vulnerability for those with ASD, many of whom remain reliant on support services that they typically lose at high school graduation (Taylor and Seltzer 2010). Specifically, specialized schools, social support programs, and transitional living programs seemed to not only provide them with social support but also assistance in building independence and transitioning to adult roles, including employment. Despite TD participants' exposure to support programs designed to facilitate the transition to college life (e.g., freshman orientation, tutoring), they were still less likely than the ASD group to discuss how these programs facilitated their transition. While the TD group depended on both personal and contextual supports, the ASD group predominately relied on contextual supports including formal support programs and informal supports, such as guidance from family, peers, caring adults, and the broader community. This is consistent with Giarelli et al. (2013), who found a supportive context to be just as or more essential than the individual strengths of those with ASD in supporting their transition to adulthood. Thus, in conjunction with interventions to strengthen such individuals' social competence, it is crucial to foster supportive environments where they can build relationships with others sensitively attuned to their needs and challenges (Carter et al. 2013).

Compared to young adults with ASD with fair developmental outcomes, those with very good/good outcomes talked more about the positive influence of informal caring relationships, including family, peers, caring adults, and community, suggesting that developmental outcomes may be facilitated by informal social support. This is consistent with prior research indicating that for adults with ASD, informal social support eases loneliness and isolation (Tobin et al. 2014; Van Hees et al. 2015) and perceived informal support enhances quality of life (Renty and Roeyers 2006). Fostering the development of new relationships is also an important goal for interventions as those with fair outcomes reported beneficial social connections with those in support programs more often than those with very good/good outcomes, but reported less nurturing everyday relationships with family, peers, caring adults, and the community. Sprinthall (1994) explained that balancing support and challenge facilitates developmental growth; informal social support received by young adults with ASD with very good/good outcomes might have helped them meet the challenges of transitioning to adulthood. For example, this informal support might have fostered the development of social skills needed to act prosocially during challenging sociomoral situations. Specifically, qualitative evidence from the current study suggests that those with very good/good outcomes were more likely than those with fair outcomes to take an active and positive role in managing social relationships, and to utilize perspective-taking when addressing challenging sociomoral situations.

While both TD and ASD groups were as likely to perceive being non-personable as a challenge during the transition to adulthood, this perception was associated with fair outcomes for the ASD group, but did not interfere with accomplishing developmental tasks for the TD group (as all achieved very good outcomes). Since young adults with ASD with only fair outcomes talked less about informal social support, they may have lacked the social support necessary to act more personably; or, acting non-personably did not elicit support from others, worsening developmental outcomes. Noddings (2008) explained that the person receiving support always contributes significantly to a caring relationship by acknowledging, in some way, its receipt. Similar to their difficulty implementing sociomoral skills, those with fair outcomes might have been less able to affirm others' support, further reducing their support network.

### Implications for Support Programs

The transition to adulthood is a time of increasing independence for TD and ASD youth. While both groups discussed the challenges of developing independence, for those with ASD, negotiating independence extended beyond parents to also include other caring adults in their support network. Considering how critical young adults with ASD were of overly supportive or overly challenging relationships and interventions, parents and providers need to recognize their developing autonomy and support them in making their own choices, particularly regarding the types of living situations and programs that they believe may or may not be helpful.

However, it is equally crucial to ensure that young adults with ASD continue to receive appropriate support when they need it, including from parents. Barnhill's (2016) exploratory study of college support programs for young adults with ASD found that one helpful component was collaboration with parents as students with ASD accepted increasing responsibility for self-advocacy. Although the current study suggests that nurturing relationships can facilitate positive developmental outcomes for young adults with ASD, the loss of support services at high school graduation (Taylor and Seltzer 2010) is particularly problematic for those with ASD because of their unique reliance on formal support programs well into their young adult years. Continuing to provide a context of supportive relationships and when necessary, teaching these young adults the skills to more effectively engage in prosocial behavior could facilitate positive outcomes, such as deeper friendships, further independence, and gains in education and employment. Findings showing that young adults with ASD who had better developmental outcomes and talked more about the importance of informal social support, suggest that a key component of support programs may be the provision of a peer mentor who can assist in elucidating social situations and helping to integrate the young adult into the community. This is consistent with Barnhill who found that college support program providers perceived peer mentors as more helpful than social skills groups, as well as Van Hees et al. (2015), who found that college students with ASD preferred individualized social coaching to more formal social skills training.

Moral and character education programs, with their emphasis on promoting sociomoral and empathic growth, could potentially succeed in assisting those with ASD; but to date, we have no knowledge of moral or character education programs adapted or designed specifically for them. Designing interventions to improve empathy in ASD is crucial as the current study shows that using empathy in spontaneous social situations is associated with positive developmental outcomes. ToM interventions in ASD, which focus on cognitive empathy, generally improve ToM capacities but these improvements often do not generalize to real-life social situations (Begeer et al. 2011; Southall and Campbell 2015). The current study's findings show the importance of developing interventions that take a multidimensional approach to empathy, focusing on both cognitive and affective empathy, to address the nuanced empathic strengths and challenges of those with ASD.

A moral education intervention with particular relevance for young adults with ASD might include Sprinthall's (1994) work on social role-taking interventions, where students engage in role-taking experiences, such as peer counseling or teaching, that require applying helping skills in real-world settings and reflecting on those experiences with mentors. Empathy outcomes were not assessed; however, a meta-analysis of 10 studies of role-taking interventions found an average effect size of $d = 0.85$ for change in sociomoral reasoning pre-and-post interventions (Sprinthall 1994). This type of intervention is promising for young adults with ASD because it would respect their feelings of warmth and compassion and desire to help others, while challenging them to engage in prosocial behavior that depends on utilizing their empathic feelings to develop some real understanding of the perspectives of those they serve. Taking a more active and positive role and utilizing empathy in challenging sociomoral situations were shown in the current study to be associated with very good/good outcomes. Providing youth with ASD with such opportunities could be effective for them and those served; it would also show our faith in their capacities for growth, a message they need to hear frequently and consistently.

However, young adults with ASD would likely need more support than TD individuals to benefit from this kind of intervention. Specifically, the provision of informal social support when engaging in role-taking experiences may be crucial to those with ASD, as this type of support was associated with positive developmental outcomes in the current study. A modified social role-taking intervention could be embedded within a structured intervention framework used previously in effective social skills interventions for this population, such as Gantman et al. (2012) UCLA Peers for Young Adults Program (for those aged 18–23-years-old), where students learned about social skills in small groups, practiced social skills through weekly homework assignments, and received social coaching from parents.

Findings of differences between young people with ASD with very good/good outcomes and fair outcomes not only reflect the range of individuality in ASD but also call attention to the urgency of intervening to support better developmental outcomes for those most vulnerable. While all young adults with ASD may benefit from continued informal social support when needed during the transition to adulthood, the role taking intervention just described may be best targeted toward those with fair outcomes, who may continue to struggle with utilizing empathy in daily interactions.

## Limitations and Future Directions

This exploratory study has several strengths. Young adults with ASD were directly interviewed about their experiences, just as Gelbar et al. (2014) argued was necessary for developing evidence-based interventions for them. This study's examination of the association between developmental outcomes and challenging and supportive factors during the transition to adulthood is also particularly relevant to this stage in the research agenda for ASD, as the United States Department of Health and Human Services' IACC (2013) emphasized the need for research on developmental outcomes in adulthood. The study also moves the field forward by (a) exploring a new area–the sociomoral reasoning of young adults with ASD, and elaborating on their use of empathy during challenging sociomoral situations; (b) discovering a link between the use of empathy and positive developmental outcomes; (c) emphasizing how feelings of empathic concern may play a key role in encouraging moral development in ASD; and (d) suggesting the potential value of interventions that consider both affective and cognitive empathy in addressing the complex empathetic strengths and challenges of those with ASD.

Despite its strengths, this study had several limitations. Its major limitation stems from the challenge of recruiting a large diverse sample of young adults with ASD. Since most ASD participants were recruited from college-oriented programs, results might not generalize to adults not receiving such services, to older adults, or to those with intellectual disabilities. In the current study, self-reported diagnosis is likely accurate because program placement required an ASD diagnosis. However, future studies should include a diagnostic assessment to confirm diagnosis and to examine how symptom severity interacts with developmental outcomes, as well as with perceptions of supportive and challenging factors during the transition to adulthood. Obtaining information on comorbid diagnoses and age at diagnosis would also yield useful knowledge about how these variables influence developmental outcomes and the challenges of transitioning to adulthood. Future studies also need to consider the subjective perspectives of young adults with ASD on their success in achieving their life goals of employment and education, independence, and friendships in conjunction with parents,' teachers,' and support providers' viewpoints (Henninger and Taylor 2012). Finally, while 31 colleges in the United States now have support programs for young adults with ASD (Barnhill 2016), more research is needed to illuminate evidence-based strategies for assisting this population and to evaluate the effectiveness of such programs (Gelbar et al. 2014). Considering all colleges should provide effective support programs for people with ASD, intensive program development and evaluation need to proceed rapidly. Equally important is the need to develop support programs for young adults with ASD who enter the workforce after high school. Young adults with ASD have the capacity to succeed but most need continued support to maximize this potential.

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### Compliance with Ethical Standards

**Conflict of interest** The authors declare that they have no conflict of interest.

**Ethical approval** All procedures performed were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Informed consent** Informed consent was obtained from all participants included in the study.

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